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Patent

AMENDMENT

In the Claims:

1. (Currently Amended): A method of efficiently using bandwidth for contention based access and ranging ~~ranging~~ in a time-synchronized communication system, wherein the communication system comprises at least one base station and at least two subscriber units, the method ~~comprising the steps of:~~

(a) waiting for a contiguous new access opportunity time window in an uplink signalling channel, the new access opportunity time window being temporally preceeded or followed by at least one of a time window reserved for transmission of data from one of the subscriber units and and/or a time window reserved for the transmission of data to the base station from two or more of the subscriber units;

(b) scanning for an access burst message from a one or more of said subscriber unit units during the new access opportunity time window, said new access opportunity time window having a duration of at least a duration of the access burst message added to a propagation delay;

(c) acquiring an access burst message from a corresponding subscriber unit during the new access opportunity time window;

(d) sending a Tx delay time data value to the corresponding subscriber unit for communication time synchronization; and

(e) returning to step (a) if the new access opportunity has expired, else returning to step (b); such that a plurality of access burst messages are acquired from corresponding subscriber units during at least one contiguous new access opportunity time window.

2. (Currently Amended) A method of efficiently using bandwidth for contention based access and ranging in a time-synchronized communication system, wherein the communication system comprises at least one base station and at least two subscriber units, the method comprising ~~the steps of:~~

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- (a) waiting for a contiguous new access opportunity time window in an uplink signalling channel, the new access opportunity time window being temporally preceeded or followed by at least one of a time window reserved for transmission of data from one of the subscriber units and and/or a time window reserved for the transmission of data to the base station from two or more of the subscriber units;
- (b) scanning for an access burst message from a one or more of said subscriber unit units during the new access opportunity time window;
- (c) acquiring an access burst message from an associated subscriber unit during the new access opportunity time window, said new access opportunity time window having a duration of at least a duration of the access burst message added to a propagation delay;
- (d) storing a ~~Tx~~ delay time data value for the associated subscriber unit;
- (e) determining whether the new access opportunity time window has expired; and
- (f) sending the ~~Tx~~ delay time data value to the associated subscriber unit for communication time synchronization and returning to step (a) if the new access opportunity time window has expired, else returning to step (b), such that a plurality of access burst messages are acquired from associated subscriber units during at least one contiguous new access opportunity time window.

3. (Original) The method of efficiently using bandwidth for contention based access and ranging in a communication system of claim 2, wherein the access burst message from the subscriber unit comprises a packet further comprising a send time of the subscriber unit.

4. (Original) The method of efficiently using bandwidth for contention based access and ranging in a communication system of claim 2, wherein the access burst message acquired from the subscriber unit comprises a packet including an identification data associated with the subscriber unit.

5. (Currently Amended) The method of efficiently using bandwidth for contention based access and ranging in a communication system of claim 2, wherein the communication system ~~is~~ comprises a broadband wireless communication system.

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6. (Currently Amended) The method of efficiently using bandwidth for contention based access and ranging in a communication system of claim 2, wherein the communication system is comprises a cable modem communication system.

7. (Currently Amended) The method of efficiently using bandwidth for contention based access and ranging in a communication system of claim 2, wherein the communication system is comprises a satellite communication system.

8. (Currently amended) The method of efficiently using bandwidth for contention based access and ranging in a communication system of claim 2, wherein the communication system is comprises a cellular telephone communication system.

9. (Currently Amended) An apparatus for contention based access and ranging in a time-synchronized communication system, wherein the communication system comprises at least one base station and at least two subscriber units, comprising:

(a) means for detecting an occurrence of a contiguous new access opportunity time window in an uplink signalling channel, the new access opportunity time window being temporally preceeded or followed by at least one of a time window reserved for transmission of data from one of the subscriber units and and/or a time window reserved for the transmission of data to the base station from two or more of the subscriber units;

(b) means for scanning for access burst messages from corresponding subscriber units during the ~~new~~ new access opportunity time window, said new access opportunity time window having a duration of at least a duration of the access burst message added to a propagation delay;

(c) means for acquiring a plurality of access burst messages from corresponding subscriber units during the ~~new~~ new access opportunity time window; and

(d) means for sending ~~Tx~~ delay time data values to the corresponding subscriber ~~unites~~ units for communication time synchronization.

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10. (Original) The apparatus as set forth in Claim 9, wherein the access burst message obtained from the subscriber unit comprises a packet including a send time associated with the subscriber unit.

11. (Original) The apparatus as set forth in Claim 9, wherein the access burst message obtained from the subscriber unit comprises a packet including identification data associated with the subscriber unit.

12. (Currently Amended) The apparatus as set forth in Claim 9, wherein the communication system ~~is~~ comprises a broadband wireless communication system.

13. (Currently Amended) The apparatus as set forth in Claim 9, wherein the communication system ~~is~~ comprises a cable modem communication system.

14. (Currently Amended) The apparatus as set forth in Claim 9, wherein the communication system ~~is~~ comprises a satellite communication system.

15. (Currently Amended) The apparatus as set forth in Claim 9, wherein the communication system ~~is~~ comprises a cellular phone communication system.

16. (Currently Amended) Apparatus for contention based access and ranging in a time-synchronized communication system, wherein the communication system comprises at least one base station and at least two subscriber units, comprising:

(a) a scan window detection module configured to detect an occurrence of a contiguous new access opportunity time window in an uplink signalling channel, the new access opportunity time window being temporally preceeded or followed by at least one of a time window reserved for transmission of data from one of the subscriber units and and/or a time window reserved for the transmission of data to the base station from two or more of the subscriber units;

(b) a received signal scanning module configured to scan for a plurality of access burst messages from corresponding subscriber units during the new access opportunity time window, said new access opportunity time window having a duration of at least a duration of one of said access burst messages added to a propagation delay

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- (c) a received signal analysis module configured to acquire a plurality of access burst messages from corresponding subscriber units during the new access opportunity time window; and
- (d) a transmission module configured to send Tx delay time data values to the corresponding subscriber units for communication time synchronization.

17. (Previously Presented) The apparatus as set forth in Claim 16, wherein the access burst message obtained from the subscriber unit comprises a packet including a send time associated with the subscriber unit.

18. (Previously Presented) The apparatus as set forth in Claim 16, wherein the access burst message obtained from the subscriber unit comprises a packet including identification data associated with the subscriber unit.

19. (Currently amended) The apparatus as set forth in Claim 16, wherein the communication system is comprises a broadband wireless communication system.

20. (Previously Presented) The apparatus as set forth in Claim 16, further comprising a contention module configured to resolve collisions between access bursts.

21. (new) An apparatus comprising:

- (a) a scan window detection module configured to detect an occurrence of a contiguous new access opportunity time window in an uplink signalling channel of a communication system, the new access opportunity time window being temporally preceeded or followed by at least one of a time window reserved for transmission of data from one of the subscriber units and/or a time window reserved for the transmission of data to the base station from two or more of the subscriber units;
- (b) a received signal scanning module configured to scan for a plurality of access burst messages from corresponding subscriber units during the new access opportunity time window, said new access opportunity time window having a duration of at least a duration of one of said access burst messages added to a transmission delay;

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(c) a received signal analysis module configured to acquire a plurality of access burst messages from corresponding subscriber units during the new access opportunity time window; and

(d) a transmission module configured to send delay time data values to the corresponding subscriber units for communication time synchronization.

22. (New) The apparatus as set forth in Claim 21, wherein the access burst message obtained from the subscriber unit comprises a packet including a send time associated with the subscriber unit.

23. (New) The apparatus as set forth in Claim 21, wherein the access burst message obtained from the subscriber unit comprises a packet including identification data associated with the subscriber unit.

24. (New) The apparatus as set forth in Claim 21, wherein the communication system comprises a broadband wireless communication system.

25. (New) The apparatus as set forth in Claim 21, further comprising a contention module configured to resolve collisions between access bursts.